

**Math 3C Fall 2014**

**Pre-lecture 10-1 Due: Beginning of lecture-Monday, December 8.**

This is to be done on your own paper. Please write your name (last name first) on the top right corner along with your discussion section number (B02, B03 etc) and “pre-lecture [number]” (in this case “pre-lecture 10-1”).

This will be graded on effort and thoughtfulness, not on correctness. With that said, do not feel obligated to write more than necessary. This is intended for you to work on your own.

All units on this assignment will be in radians, not degrees. This assignment will require a calculator (or to find one online). Therefore, remember to make sure your calculator is working in radians.

1. Recall that  $\arcsin(\theta)$  and  $\sin^{-1}(\theta)$  mean the same thing. Find this button on your calculator. (it should be labeled  $\text{SIN}^{-1}$  or if using Wolfram|Alpha, you can type  $\text{sin}^{-1}$ )
  - (a) Pick any five numbers between  $-1.5$  and  $1.5$  and plug these into  $\sin^{-1}(\sin(\theta))$  as  $\theta$  one at a time. For example, if the first number I picked was  $.6$ , then I would put  $\sin^{-1}(\sin(.6))$  into my calculator. What do you notice?
  - (b) Now pick any five numbers either smaller (more negative) than  $-2$  or bigger than  $2$  and plug them into  $\sin^{-1}(\sin(\theta))$  as  $\theta$  one at a time. What do you notice?
  - (c) Can you explain the difference between 1 (a) and 1 (b)?
2. (a) Now pick any five numbers between  $0$  and  $1$ . For each of these five numbers as  $\theta$ , evaluate

$$\sin^{-1}(-\theta) + \sin^{-1}(\theta).$$

For example, if the first number I picked was  $.75$ , I would plug  $\sin^{-1}(-.75) + \sin^{-1}(.75)$  into my calculator. What do you notice?

- (b) What do you think  $\sin^{-1}(-\theta) + \sin^{-1}(\theta)$  always equals?
  - (c) What happens if you try to plug in a number bigger than  $1$ ?
3. Now find the  $\arccos(\theta)$  (or  $\cos^{-1}(\theta)$ ) button on your calculator. It is probably labeled  $\text{COS}^{-1}$ .
  - (a) Pick any five numbers between  $0$  and  $1$ . For each of these five numbers as  $\theta$ , evaluate

$$\cos^{-1}(-\theta) + \cos^{-1}(\theta).$$

What do you notice?

- (b) What do you think  $\cos^{-1}(-\theta) + \cos^{-1}(\theta)$  always equals?